CLAIMS

What is claimed is:

1.   A system for matching colors on materials with different properties, comprising:

a display;

5   a data store that stores one or more digital representations of materials with different properties; and

a computer component programmed to:

receive spectrophotometric data;

access one or more digital representations from the data store;

10   generate one or more images by applying the spectrophotometric data to the digital representations;

display the one or more images on the display;

receive colorimetric data associated with the images displayed on the display; and

compute synthetic reflectance curves that facilitates matching colors on materials

15   with different properties.

2.   The system of claim 1, where the spectrophotometric data is acquired from an actual physical sample colored to a desired color.

20   3.   The system of claim 1, where the display is a cathode ray tube display.

4.   The system of claim 1, where the data store is a database.

5.   The system of claim 1, where the computer comprises a single computer.

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6.   The system of claim 1, where the computer comprises two or more communicating, co-operating computer components.

7.   A computer readable medium storing computer executable portions of the system

30   of claim 1.

8.   A system for matching colors on materials with different properties, comprising:

a spectrophotometer;

a colorimeter;

a display;

5   an image data store that stores one or more digital representations of materials with

different properties;

a computer component in data communication with the spectrophotometer, the

colorimeter, the display, and the image data store, where the computer component is

programmed to:

10   receive spectrophotometric data from the spectrophotometer;

access one or more digital representations from the image data store;

generate one or more images by applying the spectrophotometric data to the

digital representations;

display the one or more images on the display;

15   receive colorimetric data associated with the images displayed on the display

from the colorimeter; and

compute synthetic reflectance curves that facilitates matching colors on materials

with different properties.

20   9.   The system of claim 8, comprising:

a formula data store that stores one or more formulae for one or more colorants; and

a formulator that receives the synthetic reflectance curves and produces a formula for a

colorant, where the formula that is produced is derived, at least in part, from a formula stored in

the formula data store.

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10.   The system of claim 9, where the colorant is one or more of an ink, a dye, a pigment, and

a paint.

11.   A method for matching colors on materials with different properties, comprising:

30   acquiring spectrophotometric data;

acquiring a digital image of a first simulated substrate;

generating a first image to display, where the first image comprises the first simulated substrate colored according to the spectrophotometric data;

displaying the first image;

acquiring first colorimetric data associated with the first displayed image;

5   acquiring a digital image of a second simulated substrate;

generating a second image to display, where the second image comprises the second simulated substrate colored according to the spectrophotometric data;

displaying the second image;

acquiring second colorimetric data associated with the second displayed image;

10   comparing the first colorimetric data with the second colorimetric data; and

computing synthetic reflectance curves of a color that when employed to color the second simulated substrate makes the display of the second simulated substrate substantially identical to the display of the first simulated substrate as colored with the spectrophotometric data.

15   12.   The method of claim 11, comprising:

computing a formula for a colorant, where the colorant, when applied to a second material, will make the second material appear to have substantially the same color as a first material.

20   13.   The method of claim 12, where the colorant is one or more of an ink, a dye, a pigment, and a paint.

14.   A computer readable medium storing computer executable instructions operable to perform computer executable aspects of the method of claim 11.

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15.   A system for matching colors on materials with different properties, comprising:

means for characterizing the color of a physical reference sample;

means for displaying a first simulation of the color of the physical reference sample;

means for acquiring colorimetric data associated with the first simulation;

30   means for generating a second simulation that represents a simulated substrate colored according to the characterizing of the color of the physical reference sample;

means for displaying the second simulation;

means for acquiring colorimetric data associated with the second simulation;

means for comparing the colorimetric data associated with the first simulation and the colorimetric data associated with the second simulation; and

means for producing spectral reflectance curves that resolves color differences identified

5   by the means for comparing.

16.   A set of application programming interfaces embodied on a computer readable medium for execution by a computer component in conjunction with matching colors on materials with different properties, comprising:

10   a first interface for communicating spectrophotometric data;

a second interface for communicating colorimetric data; and

a third interface for communicating synthetic spectrophotometric data.

17.   In a computer system having a graphical user interface comprising a display and a

15   selection device, a method of providing and selecting from a set of data entries on the display, the method comprising:

retrieving a set of data entries, each of the data entries representing one of a choice associated with matching colors on materials with different properties by acquiring and analyzing spectrophotometric and colorimetric data;

20   displaying the set of entries on the display;

receiving a data entry selection signal indicative of the selection device selecting a selected data entry; and

in response to the data entry selection signal, initiating an operation associated with the selected data entry, where the operation facilitates matching colors on materials with different

25   properties.

18.   A computer data signal embodied in a transmission medium, comprising:

a first set of instructions for processing spectrophotometric data associated with a physical reference sample;

30   a second set of instructions for generating an image from a stored digital image of a substrate and the spectrophotometric data;

a third set of instructions for processing colorimetric data associated with two or more images generated from a stored digital image of a substrate and the spectrophotometric data; and

a fourth set of instructions for generating synthetic reflectance curves that resolves color differences between the two or more images.

5   19.   A data packet for transmitting color matching data, comprising:

a first field that stores spectrophotometric data associated with a reference sample;

one or more second fields that store colorimetric data associated with digital images of substrates colored according to the spectrophotometric data; and

one or more third fields that store synthetic spectrophotometric data associated with

10   resolving color differences between the colorimetric data.